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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/787,321	02/27/2004	Kevin Faulkner	6502.0570	4320

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EXAMINER	
MEHRMANESH, ELMIRA	
ART UNIT	**PAPER NUMBER**
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/787,321	FAULKNER, KEVIN	
	Examiner	Art Unit	
	Elmira Mehrmanesh	2113	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 July 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12,14,16-20 and 22-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12,14, 16-20, and 22-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This action is in response to an amendment filed on July 23, 2007 for the application of Faulkner et al., for a "Systems and methods for performing quiescence in a storage virtualization environment" filed February 27, 2004.

Claims 1-12,14, 16-20, and 22-25 are pending in the application.

Claims 1, 4, 6, 9, 11-12, 14, and 20 have been amended.

Claims 13, 15, and 21 have been canceled.

Claims 1-12, 14, 16-20, and 22-25 are rejected under 35 USC § 102.

Claim Rejections - 35 USC § 101

In view of the amendment with respect to claim 20, the previous rejection of claims 20-25 has been withdrawn.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-12, 14, 16-20, and 22-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Reuter et al. (U.S. PGPub No. 20020019920).

As per claim 1, Reuter discloses a method comprising:

configuring a virtualization layer to interface between a host (Fig. 1B, element 140) and at least one storage device (Fig. 1B, element 160), wherein the virtualization layer defines at least one virtual volume (Fig. 1B, element 150) comprising objects defining a mapping from the at lease one virtual volume to data in the at least one storage device (page 2, paragraphs [0025], [0026]); wherein the objects are distributed across more than one processor in the virtualization layer and comprise a virtualization database (page 2, paragraph [0020])

storing information about a state of the at least one storage device in a virtualization database (page 3, paragraphs [0028], [0029], [0030])

establishing a state manager (Fig. 1B, element 110) for each of the more than one processors (Fig. 1B, element 140), wherein the state manager monitors the state of the at least one storage device (page 3, paragraphs [0035], [0036])

issuing a quiescence instruction to the state manager for each of the more than one (page 6, paragraph [0065])

and responsive to receiving a quiescence instruction by the state manager, halting long term operations underway at the time the quiescence instruction is received (pages 3-4, paragraphs [0032], [0037], [0038])

and completing short term operations comprising operations that are other than long term operations and that are underway at the time the quiescence instruction is received (page 6, paragraphs [0064], [0065]).

As per claim 2, Reuter discloses issuing the quiescence instruction when a storage device fails (page 4, paragraph [0038]).

As per claim 3, Reuter discloses issuing the quiescence instruction when a processor fails (page 3, paragraph [0032]).

As per claim 4, Reuter discloses receiving notification from the state managers when short term operations are completed and long term operations are halted (page 4, paragraph [0043]).

As per claim 5, Reuter discloses the short term operations include at least one of: a read operation and a write operation (page 4, paragraph [0038]).

As per claim 6, Reuter discloses the long term operations include at least one of rebuilding a virtual volume and scrubbing a virtual volume (page 6, paragraph [0066]).

As per claim 7, Reuter discloses reconfiguring the virtualization layer after the notification has been received from the state managers (page 4, paragraph [0040]).

As per claim 8, Reuter discloses the configuring further comprises configuring the virtualization layer not to interface with a device that has failed (page 4, paragraph [0042]).

As per claim 9, Reuter discloses a system comprising:

a plurality of storage devices (Fig. 1B, element 160) corresponding to a host (Fig. 1B, element 140)

a virtualization layer between the host and the plurality of storage devices (Fig. 1B), the virtualization layer comprising objects defining a mapping from the at lease one virtual volume (Fig. 1B, element 150) to data in the plurality of storage devices (page 2, paragraphs [0025], [0026]); wherein the objects are distributed across more than one processor in the virtualization layer and comprise a virtualization database (page 2, paragraph [0020])

a virtualization database storing information about a state of each of the plurality of storage devices (page 3, paragraphs [0028], [0029], [0030])

a plurality of processors (Fig. 1B, element 140), each processor having a state manager (Fig. 1B, element 110) that monitors the state of at least one of the plurality of storage device corresponding to the processor page 3, paragraphs [0035], [0036])

that receives a quiescence instruction in response to a change in the state of one of the plurality of storage devices (page 6, paragraph [0065])

and, responsive to receiving the quiescence instruction, halts long term operations underway at the time the quiescence instruction is received (pages 3-4, paragraphs [0032], [0037], [0038])

and completes short term operations comprising operations that are other than long term operation and that are underway at the time the quiescence instruction is received (page 6, paragraphs [0064], [0065]).

As per claim 10, Reuter discloses one of the plurality of processors comprises a master processor that issues the quiescence instruction in response to a failure of one of the plurality of storage devices (page 4, paragraph [0038]).

As per claim 11, Reuter discloses each processor's state manager further notifies the master processor when short term operations are complete and long term operations are halted (page 4, paragraph [0043]).

As per claim 12, Reuter discloses the master processor further reconfigures the virtualization layer after notification is received from each processor's state manager that short term operations are complete and long term operations are halted (page 4, paragraph [0040]).

As per claim 14, Reuter discloses a system for dynamically updating storage (Fig. 1B, element 160) associated with a host (Fig. 1B, element 140) comprising:

means for configuring a virtualization layer to interface between a host (Fig. 1B, element 140) and at least one storage device (Fig. 1B, element 160) wherein the virtualization layer defines at least one virtual volume (Fig. 1B, element 150) comprising objects defining a mapping from at least one virtual volume to data in the at least one storage device (page 2, paragraphs [0025], [0026]); wherein the objects are distributed across more than one processor in the virtualization layer and comprise a virtualization database (page 2, paragraph [0020])

means for storing information (Fig. 2) about a state of the at least one storage device in a virtualization database; means for receiving data about a new state of the at least one storage device (page 3, paragraphs [0028], [0029], [0030])

means for updating the virtualization database with the data about the new state of the storage device (page 5, paragraph [0058])

means for updating the mapping contained in the objects comprising the virtual volume based on the data about the new state of the storage (page 5, paragraph [0053]).

As per claim 16, Reuter discloses the updating is responsive to the storage device becoming an available storage device (page 5, paragraph [0058]).

As per claim 17, Reuter discloses the updating is responsive to the storage device becoming an unavailable storage device (page 5, paragraph [0055]).

As per claim 18, Reuter discloses means for reconfiguring the virtualization layer after the mapping has been updated to form a reconfigured virtualization layer, wherein the reconfigured virtualization layer does not interface with the unavailable storage device (page 6, paragraph [0061]).

As per claim 19, Reuter discloses means for reconfiguring the virtualization layer after the mapping has been updated to form a reconfigured virtualization layer, wherein the reconfigured virtualization layer interfaces with the available storage device (page 5, paragraph [0055]).

As per claim 20, Reuter discloses a tangibly-embodied computer-readable medium, containing code for directing a processor to perform a method for dynamically updating storage associated with a host (page 2, paragraph [0018]), the method comprising:

for configuring a virtualization layer to interface between a host (Fig. 1B, element 140) and at least one storage device (Fig. 1B, element 160) wherein the virtualization layer defines at least one virtual volume (Fig. 1B, element 150) comprising objects defining a mapping from at least one virtual volume to data in the at least one storage device (page 2, paragraphs [0025], [0026]); wherein the

objects are distributed across more than one processor in the virtualization layer and comprise a virtualization database (page 2, paragraph [0020])

storing information (Fig. 2) about a state of the at least one storage device in a virtualization database; means for receiving data about a new state of the at least one storage device (page 3, paragraphs [0028], [0029], [0030])

updating the virtualization database with the data about the new state of the storage device (page 5, paragraph [0058])

updating the mapping contained in the objects comprising the virtual volume based on the data about the new state of the storage (page 5, paragraph [0053]).

As per claim 22, Reuter discloses the updating is responsive to the storage device becoming an available storage device (page 5, paragraph [0058]).

As per claim 23, Reuter discloses the updating is responsive to the storage device becoming an unavailable storage device (page 5, paragraph [0055]).

As per claim 24, Reuter discloses reconfiguring the virtualization layer to form a reconfigured virtualization layer after the mapping has been updated, wherein the reconfigured virtualization layer interfaces with the unavailable storage device (page 6, paragraph [0061]).

As per claim 25, Reuter discloses reconfiguring the virtualization layer to form a reconfigured virtualization layer after the mapping has been updated, wherein the reconfigured virtualization layer interfaces with the available storage device (page 5, paragraph [0058]).

Response to Arguments

Applicant's arguments with respect to claims 1, 9, 14 and 20 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elmira Mehrmanesh whose telephone number is (571) 272-5531. The examiner can normally be reached on 9-5 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert W. Beausoliel can be reached on (571) 272-3645. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).